



## SEQUENCE LISTING

<110> Yon, Jeffrey, R  
Grantham, Christopher J  
Groot-Kormelink, Paulus J

<120> Nicotinic Acetylcholine Receptor

<130> JAB 1529 USA

<140> US 09/661,812

<141> 2000-09-14

<150> US 60/153,948

<151> 1999-09-15

<150> GB 0002431.5

<151> 2000-02-02

<160> 24

<170> PatentIn version 3.0

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Phe Arg Asp Leu Phe Ala Asn Tyr Thr Ser Ala Leu Arg Pro Val Ala  
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gac aca gac cag act ctg aat gtg acc ctg gag gtg aca ctg tcc cag 144  
Asp Thr Asp Gln Thr Leu Asn Val Thr Leu Glu Val Thr Leu Ser Gln  
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atc atc gac atg gat gaa cgg aac cag gtg ctg acc ctg tat ctg tgg 192  
Ile Ile Asp Met Asp Glu Arg Asn Gln Val Leu Thr Leu Tyr Leu Trp  
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Ile Arg Gln Glu Trp Thr Asp Ala Tyr Leu Arg Trp Asp Pro Asn Ala  
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Tyr Gly Gly Leu Asp Ala Ile Arg Ile Pro Ser Ser Leu Val Trp Arg  
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Pro Asp Ile Val Leu Tyr Asn Lys Ala Asp Ala Gln Pro Pro Gly Ser	
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Ala Ser Thr Asn Val Val Leu Arg His Asp Gly Ala Val Arg Trp Asp	
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Ala Pro Ala Ile Thr Arg Ser Ser Cys Arg Val Asp Val Ala Ala Phe	
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Ala Asp Phe Val Glu Asn Val Glu Trp Arg Val Leu Gly Met Pro Ala	
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Arg Arg Arg Val Leu Thr Tyr Gly Cys Cys Ser Glu Pro Tyr Pro Asp	
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Val Thr Phe Thr Leu Leu Leu Arg Arg Arg Ala Ala Ala Tyr Val Cys	
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Asn Leu Leu Leu Pro Cys Val Leu Ile Ser Leu Leu Ala Pro Leu Ala	
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Phe His Leu Pro Ala Asp Ser Gly Glu Lys Val Ser Leu Gly Val Thr	
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Val Leu Leu Ala Leu Thr Val Phe Gln Leu Leu Leu Ala Glu Ser Met	
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Pro Pro Ala Glu Ser Val Pro Leu Ile Gly Lys Tyr Tyr Met Ala Thr	
275 280 285	
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Met Thr Met Val Thr Phe Ser Thr Ala Leu Thr Ile Leu Ile Met Asn	
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Gly	Glu	Pro	Cys	Gly	Gln	Ser	Arg	Pro	Pro	Glu	Leu	Ser	Pro	Ser	Pro		
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cag	tcg	cct	gaa	gga	ggg	gct	ggc	ccc	cca	gcg	ggc	cct	tgc	cac	gag	1104	
Gln	Ser	Pro	Glu	Gly	Gly	Ala	Gly	Pro	Pro	Ala	Gly	Pro	Cys	His	Glu		
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Pro	Arg	Cys	Leu	Cys	Arg	Gln	Glu	Ala	Leu	Leu	His	His	Val	Ala	Thr		
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Ile	Ala	Asn	Thr	Phe	Arg	Ser	His	Arg	Ala	Ala	Gln	Arg	Cys	His	Glu		
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Phe	Phe	Ser	Met	Ala	Leu	Val	Met	Ser	Leu	Leu	Val	Leu	Val	Gln	Ala		
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Leu																	

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Asp	Thr	Asp	Gln	Thr	Leu	Asn	Val	Thr	Leu	Glu	Val	Thr	Leu	Ser	Gln		
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Ile	Ile	Asp	Met	Asp	Glu	Arg	Asn	Gln	Val	Leu	Thr	Leu	Tyr	Leu	Trp		
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 Pro Phe Asp Ala Gln His Cys Gly Leu Thr Phe Gly Ser Trp Thr His  
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 Gly Gly His Gln Leu Asp Val Arg Pro Arg Gly Ala Ala Ala Ser Leu  
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 Ala Asp Phe Val Glu Asn Val Glu Trp Arg Val Leu Gly Met Pro Ala  
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 Arg Arg Arg Val Leu Thr Tyr Gly Cys Cys Ser Glu Pro Tyr Pro Asp  
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 Val Thr Phe Thr Leu Leu Leu Arg Arg Arg Ala Ala Ala Tyr Val Cys  
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 Asn Leu Leu Leu Pro Cys Val Leu Ile Ser Leu Leu Ala Pro Leu Ala  
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 Phe His Leu Pro Ala Asp Ser Gly Glu Lys Val Ser Leu Gly Val Thr  
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 Val Leu Leu Ala Leu Thr Val Phe Gln Leu Leu Leu Ala Glu Ser Met  
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 325 330 335  
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 340 345 350  
 Gln Ser Pro Glu Gly Gly Ala Gly Pro Pro Ala Gly Pro Cys His Glu  
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Asp Trp Lys Arg Leu Ala Arg Val Met Asp Arg Phe Phe Leu Ala Ile  
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 Leu Ser Leu Gly Leu Leu Leu Leu Phe Leu Leu Pro Ala Glu Cys Leu  
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gga gct gag ggc cgg ctg gct ctc aag ctg ttc cgt gac ctc ttt gcc 150  
 Gly Ala Glu Gly Arg Leu Ala Leu Lys Leu Phe Arg Asp Leu Phe Ala  
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 Asn Tyr Thr Ser Ala Leu Arg Pro Val Ala Asp Thr Asp Gln Thr Leu  
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aat gtg acc ctg gag gtg aca ctg tcc cag atc atc gac atg gat gaa 246  
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cgg aac cag gtg ctg acc ctg tat ctg tgg ata cgg cag gag tgg aca 294  
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gat gcc tac cta cga tgg gac ccc aat gcc tat ggt ggc ctg gat gcc 342  
 Asp Ala Tyr Leu Arg Trp Asp Pro Asn Ala Tyr Gly Gly Leu Asp Ala  
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 Ile Arg Ile Pro Ser Ser Leu Val Trp Arg Pro Asp Ile Val Leu Tyr  
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aac aaa gcc gac gcg cag cct cca ggt tcc gcc agc acc aac gtg gtc 438  
 Asn Lys Ala Asp Ala Gln Pro Pro Gly Ser Ala Ser Thr Asn Val Val  
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ctg cgc cac gat ggc gcc gtg cgc tgg gac gcg ccg gcc atc acg cgc 486  
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Ser Ser Cys Arg Val Asp Val Ala Ala Phe Pro Phe Asp Ala Gln His			
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Cys Gly Leu Thr Phe Gly Ser Trp Thr His Gly Gly His Gln Leu Asp			
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gtg cgg ccg cgc ggc gct gca gcc agc ctg gcg gac ttc gtg gag aac			630
Val Arg Pro Arg Gly Ala Ala Ala Ser Leu Ala Asp Phe Val Glu Asn			
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Val Glu Trp Arg Val Leu Gly Met Pro Ala Arg Arg Arg Val Leu Thr			
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Tyr Gly Cys Cys Ser Glu Pro Tyr Pro Asp Val Thr Phe Thr Leu Leu			
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Leu Arg Arg Arg Ala Ala Ala Tyr Val Cys Asn Leu Leu Leu Pro Cys			
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Val Leu Ile Ser Leu Leu Ala Pro Leu Ala Phe His Leu Pro Ala Asp			
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tca ggc gag aag gtg tcg ctg ggc gtc acc gtg ctg ctg gcg ctc acc			870
Ser Gly Glu Lys Val Ser Leu Gly Val Thr Val Leu Leu Ala Leu Thr			
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Val Phe Gln Leu Leu Leu Ala Glu Ser Met Pro Pro Ala Glu Ser Val			
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ccg ctc atc ggg aag tac tac atg gcc act atg acc atg gtc aca ttc			966
Pro Leu Ile Gly Lys Tyr Tyr Met Ala Thr Met Thr Met Val Thr Phe			
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Ser Thr Ala Leu Thr Ile Leu Ile Met Asn Leu His Tyr Cys Gly Pro			
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agt gtc cgc cca gtg cca gcc tgg gct agg gcc ctc ctg ctg gga cac			1062
Ser Val Arg Pro Val Pro Ala Trp Ala Arg Ala Leu Leu Leu Gly His			
330	335	340	
ctg gca cgg ggc ctg tgc gtg cgg gaa aga ggg gag ccc tgt ggg cag			1110
Leu Ala Arg Gly Leu Cys Val Arg Glu Arg Gly Glu Pro Cys Gly Gln			
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Ser Arg Pro Pro Glu Leu Ser Pro Ser Pro Gln Ser Pro Glu Gly Gly			
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 395 400 405

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 Arg Val Met Asp Arg Phe Phe Leu Ala Ile Phe Phe Ser Met Ala Leu  
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gtc atg agc ctc ctg gtg ctg gtg cag gcc ctg tga gggctgggac 1396  
 Val Met Ser Leu Leu Val Leu Val Gln Ala Leu  
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taagtcatct agagggccct tcgaaggtaa gcctatccct aaccctctcc tcggtctcga 1456

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Leu Phe Arg Asp Leu Phe Ala Asn Tyr Thr Ser Ala Leu Arg Pro Val  
 35 40 45

Ala Asp Thr Asp Gln Thr Leu Asn Val Thr Leu Glu Val Thr Leu Ser  
 50 55 60

Gln Ile Ile Asp Met Asp Glu Arg Asn Gln Val Leu Thr Leu Tyr Leu  
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Trp Ile Arg Gln Glu Trp Thr Asp Ala Tyr Leu Arg Trp Asp Pro Asn  
 85 90 95

Ala Tyr Gly Gly Leu Asp Ala Ile Arg Ile Pro Ser Ser Leu Val Trp  
 100 105 110

Arg Pro Asp Ile Val Leu Tyr Asn Lys Ala Asp Ala Gln Pro Pro Gly  
 115 120 125

Ser Ala Ser Thr Asn Val Val Leu Arg His Asp Gly Ala Val Arg Trp  
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Asp Ala Pro Ala Ile Thr Arg Ser Ser Cys Arg Val Asp Val Ala Ala  
 145 150 155 160

Phe Pro Phe Asp Ala Gln His Cys Gly Leu Thr Phe Gly Ser Trp Thr  
 165 170 175

His Gly Gly His Gln Leu Asp Val Arg Pro Arg Gly Ala Ala Ala Ser  
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Leu Ala Asp Phe Val Glu Asn Val Glu Trp Arg Val Leu Gly Met Pro  
 195 200 205

Ala Arg Arg Arg Val Leu Thr Tyr Gly Cys Cys Ser Glu Pro Tyr Pro  
 210 215 220

Asp Val Thr Phe Thr Leu Leu Leu Arg Arg Arg Ala Ala Ala Tyr Val  
 225 230 235 240

Cys Asn Leu Leu Leu Pro Cys Val Leu Ile Ser Leu Leu Ala Pro Leu  
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Ala Phe His Leu Pro Ala Asp Ser Gly Glu Lys Val Ser Leu Gly Val  
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Thr Val Leu Leu Ala Leu Thr Val Phe Gln Leu Leu Leu Ala Glu Ser  
 275 280 285

Met Pro Pro Ala Glu Ser Val Pro Leu Ile Gly Lys Tyr Tyr Met Ala  
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Thr Met Thr Met Val Thr Phe Ser Thr Ala Leu Thr Ile Leu Ile Met  
 305 310 315 320

Asn Leu His Tyr Cys Gly Pro Ser Val Arg Pro Val Pro Ala Trp Ala



325

330

335

Arg Ala Leu Leu Leu Gly His Leu Ala Arg Gly Leu Cys Val Arg Glu  
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Arg Gly Glu Pro Cys Gly Gln Ser Arg Pro Pro Glu Leu Ser Pro Ser  
 355 360 365

Pro Gln Ser Pro Glu Gly Gly Ala Gly Pro Pro Ala Gly Pro Cys His  
 370 375 380

Glu Pro Arg Cys Leu Cys Arg Gln Glu Ala Leu Leu His His Val Ala  
 385 390 395 400

Thr Ile Ala Asn Thr Phe Arg Ser His Arg Ala Ala Gln Arg Cys His  
 405 410 415

Glu Asp Trp Lys Arg Leu Ala Arg Val Met Asp Arg Phe Phe Leu Ala  
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Ile Phe Phe Ser Met Ala Leu Val Met Ser Leu Leu Val Leu Val Gln  
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Ala Leu  
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Leu Phe Arg Asp Leu Phe Ala Asn Tyr Thr Ser Ala Leu Arg Pro Val  
 35 40 45

Ala Asp Thr Asp Gln Thr Leu Asn Val Thr Leu Glu Val Thr Leu Ser  
 50 55 60

Gln Ile Ile Asp Met Asp Glu Arg Asn Gln Val Leu Thr Leu Tyr Leu  
 65 70 75 80

Trp Ile Arg Gln Glu Trp Thr Asp Ala Tyr Leu His Trp Asp Pro Lys  
 85 90 95  
 Ala Tyr Gly Asp Leu Asp Ala Ile Arg Ile Pro Ser Arg Leu Val Trp  
 100 105 110  
 Arg Pro Asp Ile Val Leu Tyr Asn Lys Ala Asp Thr Gln Pro Pro Ala  
 115 120 125  
 Ser Ala Ser Thr Asn Val Val Val Arg His Asp Gly Ala Val Arg Trp  
 130 135 140  
 Asp Ala Pro Ala Ile Thr Arg Ser Ser Cys Arg Val Asp Val Ser Ala  
 145 150 155 160  
 Phe Pro Phe Asp Ala Gln Arg Cys Gly Leu Thr Phe Gly Ser Trp Thr  
 165 170 175  
 His Gly Gly His Gln Leu Asp Val Arg Pro Arg Gly Thr Ser Ala Ser  
 180 185 190  
 Leu Ala Asp Phe Val Glu Asn Val Glu Trp Arg Val Leu Gly Met Pro  
 195 200 205  
 Ala Arg Arg Arg Val Leu Thr Tyr Gly Cys Cys Ser Glu Pro Tyr Pro  
 210 215 220  
 Asp Val Thr Phe Thr Leu Leu Leu Arg Arg Arg Ala Ala Ala Tyr Val  
 225 230 235 240  
 Cys Asn Leu Leu Leu Pro Cys Val Phe Ile Ser Leu Leu Ala Pro Leu  
 245 250 255  
 Ala Phe His Leu Pro Ala Asp Ser Gly Glu Lys Val Ser Leu Gly Val  
 260 265 270  
 Thr Val Leu Leu Ala Leu Thr Val Phe Gln Leu Ile Leu Ala Glu Ser  
 275 280 285  
 Met Pro Pro Ala Glu Ser Val Pro Leu Ile Gly Lys Tyr Tyr Met Ala  
 290 295 300  
 Thr Met Thr Met Val Thr Phe Ser Thr Ala Leu Thr Ile Leu Ile Met  
 305 310 315 320  
 Asn Leu His Tyr Cys Gly Pro Asn Ala His Pro Val Pro Ala Trp Ala  
 325 330 335  
 Arg Val Leu Leu Leu Gly His Leu Ala Lys Gly Leu Cys Val Arg Glu  
 340 345 350  
 Arg Gly Glu Pro Cys Gly Gln Ser Lys Pro Leu Glu Ser Ala Pro Ser  
 355 360 365  
 Leu Gln Pro Pro Pro Ala Ser Pro Ala Gly Pro Cys His Glu Pro Arg  
 370 375 380

Cys Leu Cys His Gln Glu Ala Leu Leu His His Ile Ala Ser Ile Ala  
 385 390 395 400

Ser Thr Phe Arg Ser His Arg Ala Ala Gln Arg Arg His Glu Asp Trp  
 405 410 415

Lys Arg Leu Ala Arg Val Met Asp Arg Phe Phe Leu Gly Ile Phe Phe  
 420 425 430

Cys Met Ala Leu Val Met Ser Leu Ile Val Leu Val Gln Ala Leu  
 435 440 445

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His Lys Leu Leu His Asp Leu Phe Ala Asn Tyr Ser Ser Ala Leu Arg  
 35 40 45

Pro Ala Glu Asp Thr Glu Arg Ala Leu Asn Val Thr Leu Gln Val Thr  
 50 55 60

Leu Ser Gln Ile Ile Asp Met Asp Glu Arg Asn Gln Val Leu Thr Ser  
 65 70 75 80

Tyr Leu Trp Val Arg Gln Ala Trp Leu Asp Ala His Leu Ala Trp Asp  
 85 90 95

Lys Asp Ala Tyr Gly Gly Ile Asp Ser Ile Arg Ile Pro Ser Ser Tyr  
 100 105 110

Val Trp Arg Pro Asp Ile Val Leu Tyr Asn Asn Ala Asp Glu Arg Phe  
 115 120 125

Gly Gly Ser Met Glu Thr Asn Val Val Leu Arg Ser Asp Gly His Ile  
 130 135 140

Met Trp Asp Ser Pro Ala Ile Thr Lys Ser Ser Cys Lys Val Asp Val  
 145 150 155 160

Ser Tyr Phe Pro Phe Asp Gly Gln Gln Cys Arg Leu Thr Phe Gly Ser  
 165 170 175

Trp Thr Tyr Asn Gly Asn Gln Ile Asp Leu Arg Asn Leu Leu Asp Thr  
 180 185 190

Gly Asp Leu Thr Asp Phe Val Glu Asn Val Glu Trp Glu Val Leu Gly

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Tyr Pro Asp Val Thr Tyr Thr Leu Leu Leu Arg Arg Arg Ala Ser Phe 225 230 235 240		
Tyr Ile Phe Asn Leu Leu Leu Pro Cys Val Met Ile Ser Phe Leu Ala 245 250 255		
Pro Leu Gly Phe Tyr Leu Pro Ala Asp Ser Gly Glu Lys Val Ser Leu 260 265 270		
Gly Val Thr Val Leu Leu Ala Leu Thr Val Phe Gln Leu Leu Val Ala 275 280 285		
Glu Ser Met Pro Pro Ser Glu Ser Val Pro Leu Ile Gly Lys Tyr Tyr 290 295 300		
Ile Ala Thr Met Thr Met Ile Thr Ala Ser Thr Ala Leu Thr Ile Phe 305 310 315 320		
Ile Met Asn Ile His His Cys Gly Pro Gly Ala Arg Pro Val Pro Pro 325 330 335		
Trp Ala Arg Arg Leu Ile Leu His His Leu Ala Arg Ala Leu Cys Val 340 345 350		
Cys Glu Val Gly Glu Ser Cys Gly Arg Pro Gln Arg Glu Gly Thr Gly 355 360 365		
Gly Met Gly Pro Arg Asp Pro Pro Gly Glu Gly Val Glu Pro Gly Leu 370 375 380		
Cys Pro Arg Ser Arg Cys Leu Cys His His His Ala Val Leu Ser Ser 385 390 395 400		
Val Gly Tyr Ile Ala Gly Val Phe Arg Arg His Arg Thr Ala Gln Arg 405 410 415		
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Gly Lys Ala Ala 450		

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 <213> Homo sapiens

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 Val Glu Asp Thr Asp Lys Val Leu Asn Val Thr Leu Gln Ile Thr Leu  
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 Ser Gln Ile Lys Asp Met Asp Glu Arg Asn Gln Ile Leu Thr Ala Tyr  
 65 70 75 80  
 Leu Trp Ile Arg Gln Ile Trp His Asp Ala Tyr Leu Thr Trp Asp Arg  
 85 90 95  
 Asp Gln Tyr Asp Gly Leu Asp Ser Ile Arg Ile Pro Ser Asp Leu Val  
 100 105 110  
 Trp Arg Pro Asp Ile Val Leu Tyr Asn Lys Ala Asp Asp Glu Ser Ser  
 115 120 125  
 Glu Pro Val Asn Thr Asn Val Val Leu Arg Tyr Asp Gly Leu Ile Thr  
 130 135 140  
 Trp Asp Ala Pro Ala Ile Thr Lys Ser Ser Cys Val Val Asp Val Thr  
 145 150 155 160  
 Tyr Phe Pro Phe Asp Asn Gln Gln Cys Asn Leu Thr Phe Gly Ser Trp  
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 Thr Tyr Asn Gly Asn Gln Val Asp Ile Phe Asn Ala Leu Asp Ser Gly  
 180 185 190  
 Asp Leu Ser Asp Phe Ile Glu Asp Val Glu Trp Glu Val His Gly Met  
 195 200 205  
 Pro Ala Val Lys Asn Val Ile Ser Tyr Gly Cys Cys Ser Glu Pro Tyr  
 210 215 220  
 Pro Asp Val Thr Phe Thr Leu Leu Leu Lys Arg Arg Ser Ser Phe Tyr  
 225 230 235 240  
 Ile Val Asn Leu Leu Ile Pro Cys Val Leu Ile Ser Phe Leu Ala Pro  
 245 250 255  
 Leu Ser Phe Tyr Leu Pro Ala Ala Ser Gly Glu Lys Val Ser Leu Gly  
 260 265 270  
 Val Thr Ile Leu Leu Ala Met Thr Val Phe Gln Leu Met Val Ala Glu  
 275 280 285  
 Ile Met Pro Ala Ser Glu Asn Val Pro Leu Ile Gly Lys Tyr Tyr Ile  
 290 295 300

Ala Thr Met Ala Leu Ile Thr Ala Ser Thr Ala Leu Thr Ile Met Val  
 305 310 315 320  
 Met Asn Ile His Phe Cys Gly Ala Glu Ala Arg Pro Val Pro His Trp  
 325 330 335  
 Ala Arg Val Val Ile Leu Lys Tyr Met Ser Arg Val Leu Phe Val Tyr  
 340 345 350  
 Asp Val Gly Glu Ser Cys Leu Ser Pro His His Ser Arg Glu Arg Asp  
 355 360 365  
 His Leu Thr Lys Val Tyr Ser Lys Leu Pro Glu Ser Asn Leu Lys Ala  
 370 375 380  
 Ala Arg Asn Lys Asp Leu Ser Arg Lys Lys Asp Met Asn Lys Arg Leu  
 385 390 395 400  
 Lys Asn Asp Leu Gly Cys Gln Gly Lys Asn Pro Gln Glu Ala Glu Ser  
 405 410 415  
 Tyr Cys Ala Gln Tyr Lys Val Leu Thr Arg Asn Ile Glu Tyr Ile Ala  
 420 425 430  
 Lys Cys Leu Lys Asp His Lys Ala Thr Ser Ser Lys Gly Ser Glu Trp  
 435 440 445  
 Lys Lys Val Ala Lys Val Ile Asp Arg Phe Phe Met Trp Ile Phe Phe  
 450 455 460  
 Ile Met Val Phe Val Met Thr Ile Leu Ile Ile Ala Arg Ala Asp  
 465 470 475

<210> 8  
 <211> 479  
 <212> PRT  
 <213> Rattus sp.

<400> 8

Met Asn Arg Pro His Ser Cys Leu Ser Phe Cys Trp Met Tyr Phe Ala  
 1 5 10 15  
 Ala Ser Gly Ile Arg Ala Val Glu Thr Ala Asn Gly Lys Tyr Ala Gln  
 20 25 30  
 Lys Leu Phe Ser Asp Leu Phe Glu Asp Tyr Ser Ser Ala Leu Arg Pro  
 35 40 45  
 Val Glu Asp Thr Asp Ala Val Leu Asn Val Thr Leu Gln Val Thr Leu  
 50 55 60  
 Ser Gln Ile Lys Asp Met Asp Glu Arg Asn Gln Ile Leu Thr Ala Tyr  
 65 70 75 80  
 Leu Trp Ile Arg Gln Thr Trp His Asp Ala Tyr Leu Thr Trp Asp Arg  
 85 90 95

Asp	Gln	Tyr	Asp	Arg	Leu	Asp	Ser	Ile	Arg	Ile	Pro	Ser	Asp	Leu	Val	100	105	110
Trp	Arg	Pro	Asp	Ile	Val	Leu	Tyr	Asn	Lys	Ala	Asp	Asp	Glu	Ser	Ser	115	120	125
Glu	Pro	Val	Asn	Thr	Asn	Val	Val	Leu	Arg	Tyr	Asp	Gly	Leu	Ile	Thr	130	135	140
Trp	Asp	Ser	Pro	Ala	Ile	Thr	Lys	Ser	Ser	Cys	Val	Val	Asp	Val	Thr	145	150	155
Tyr	Phe	Pro	Phe	Asp	Ser	Gln	Gln	Cys	Asn	Leu	Thr	Phe	Gly	Ser	Trp	165	170	175
Thr	Tyr	Asn	Gly	Asn	Gln	Val	Asp	Ile	Phe	Asn	Ala	Leu	Asp	Ser	Gly	180	185	190
Asp	Leu	Ser	Asp	Phe	Ile	Glu	Asp	Val	Glu	Trp	Glu	Val	His	Gly	Met	195	200	205
Pro	Ala	Val	Lys	Asn	Val	Ile	Ser	Tyr	Gly	Cys	Cys	Ser	Glu	Pro	Tyr	210	215	220
Pro	Asp	Val	Thr	Phe	Thr	Leu	Leu	Leu	Lys	Arg	Arg	Ser	Ser	Phe	Tyr	225	230	235
Ile	Val	Asn	Leu	Leu	Ile	Pro	Cys	Val	Leu	Ile	Ser	Phe	Leu	Ala	Pro	245	250	255
Leu	Ser	Phe	Tyr	Leu	Pro	Ala	Ala	Ser	Gly	Glu	Lys	Val	Ser	Leu	Gly	260	265	270
Val	Thr	Ile	Leu	Leu	Ala	Met	Thr	Val	Phe	Gln	Leu	Met	Val	Ala	Glu	275	280	285
Ile	Met	Pro	Ala	Ser	Glu	Asn	Val	Pro	Leu	Ile	Gly	Lys	Tyr	Tyr	Ile	290	295	300
Ala	Thr	Met	Ala	Leu	Ile	Thr	Ala	Ser	Thr	Ala	Leu	Thr	Ile	Met	Val	305	310	315
Met	Asn	Ile	His	Phe	Cys	Gly	Ala	Glu	Ala	Arg	Pro	Val	Pro	His	Trp	325	330	335
Ala	Lys	Val	Val	Ile	Leu	Lys	Tyr	Met	Ser	Arg	Ile	Leu	Phe	Val	Tyr	340	345	350
Asp	Val	Gly	Glu	Ser	Cys	Leu	Ser	Pro	Arg	His	Ser	Gln	Glu	Pro	Glu	355	360	365
Gln	Val	Thr	Lys	Val	Tyr	Ser	Lys	Leu	Pro	Glu	Ser	Asn	Leu	Lys	Thr	370	375	380
Ser	Arg	Asn	Lys	Asp	Leu	Ser	Arg	Lys	Lys	Glu	Val	Arg	Lys	Leu	Leu	385	390	395

Lys Asn Asp Leu Gly Tyr Gln Gly Gly Ile Pro Gln Asn Thr Asp Ser  
405 410 415

Tyr Cys Ala Arg Tyr Glu Ala Leu Ala Lys Asn Ile Glu Tyr Ile Ala  
420 425 430

Lys Cys Leu Lys Asp His Lys Ala Thr Asn Ser Lys Gly Ser Glu Trp  
435 440 445

Lys Lys Val Ala Lys Val Ile Asp Arg Phe Phe Met Trp Ile Phe Phe  
450 455 460

Ala Met Val Phe Val Met Thr Val Leu Ile Ile Ala Arg Ala Asp  
465 470 475

<210> 9  
<211> 24  
<212> DNA  
<213> Artificial

<220>  
<223> Primer

<400> 9  
ggaaaatgtg tgtgtcagta aagc

24

<210> 10  
<211> 20  
<212> DNA  
<213> Artificial

<220>  
<223> Primer

<400> 10  
gaagtgtttt cagagtgagg

20

<210> 11  
<211> 17  
<212> DNA  
<213> Artificial

<220>  
<223> Primer

<400> 11  
cagcaccaac gtggtcc

17

<210> 12  
<211> 18  
<212> DNA  
<213> Artificial



<220>  
<223> Primer

<400> 12  
ggcaccaact ggatgtgc

18

<210> 13  
<211> 19  
<212> DNA  
<213> Artificial

<220>  
<223> Primer

<400> 13  
cacgttctcc acgaagtcc

19

<210> 14  
<211> 18  
<212> DNA  
<213> Artificial

<220>  
<223> Primer

<400> 14  
cagccgtagg tgagcacg

18

<210> 15  
<211> 20  
<212> DNA  
<213> Artificial

<220>  
<223> Primer

<400> 15  
tggcaggctt ttggacttcc

20

<210> 16  
<211> 21  
<212> DNA  
<213> Artificial

<220>  
<223> Primer

<400> 16  
tcttggcctt tgtagagttc c

21

<210> 17  
<211> 20

<212> DNA  
<213> Artificial

<220>  
<223> Primer

<400> 17  
tggcgccaga agatagtacc

20

<210> 18  
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<212> DNA  
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<220>  
<223> Primer

<400> 18  
tcactccatg gcccttacc

19

<210> 19  
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<212> DNA  
<213> Homo sapiens

<220>  
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<222> (59)..(140)

<220>  
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<220>  
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aag tgt gtt ttc aga gtg agg gag tgt tcc atc gca tca gaa gtt ttg 106  
Lys Cys Val Phe Arg Val Arg Glu Cys Ser Ile Ala Ser Glu Val Leu  
1 5 10 15

aag aaa cca gct cga gat gga gaa gtg gaa aca g gtttgagaga 150  
Lys Lys Pro Ala Arg Asp Gly Glu Val Glu Thr  
20 25

tactggaggg ggcagagcag tgggatttag aatccctggg tgaaagtctg gactctcgtg 210

gcttatttgg gccctctag catttgtgga gaggcaggca gactccaggt ccttgaaaag 270

gggaggggtgg aggagaaatt tgtcagcctg gcgccagaag atagtaccag ttcactccat 330

ggcccttacc tcatgtgtcc ctgcaggcag gccagggagg aactagagcc acagctagag 390

caagagaagg cagacaccag gaggacactc ataaggacag ggccccagcc ctgggagtgg 450  
 aggggtgtgag cagagggcct gggactaggg cctgggatgg acaaccctcc ttactgaccc 510  
 tccag ag tgc ctg gga gct gag ggc cgg ctg gct ctc aag ctg ttc cgt 559  
     Glu Cys Leu Gly Ala Glu Gly Arg Leu Ala Leu Lys Leu Phe Arg  
         30                    35                    40  
 gac ctc ttt gcc aac tac aca agt gcc ctg aga cct gtg gca gac aca 607  
 Asp Leu Phe Ala Asn Tyr Thr Ser Ala Leu Arg Pro Val Ala Asp Thr  
         45                    50                    55  
 gac cag act ctg aat gtg acc ctg gag gtg aca ctg tcc cag atc atc 655  
 Asp Gln Thr Leu Asn Val Thr Leu Glu Val Thr Leu Ser Gln Ile Ile  
         60                    65                    70  
 gac atg gat gaa cgg gac cag gtg ctg acc ctg tat ctg tgg ata cgg 703  
 Asp Met Asp Glu Arg Asp Gln Val Leu Thr Leu Tyr Leu Trp Ile Arg  
         75                    80                    85                    90  
 cag gag tgg aca gat gcc tac cta cga tgg grc ccc aat gcc tat ggt 751  
 Gln Glu Trp Thr Asp Ala Tyr Leu Arg Trp Xaa Pro Asn Ala Tyr Gly  
         95                    100                    105  
 ggc ctg gat gcc atc cgc atc ccc agc agt ctt gtg tgg cgg cca gac 799  
 Gly Leu Asp Ala Ile Arg Ile Pro Ser Ser Leu Val Trp Arg Pro Asp  
         110                    115                    120  
 atc gta ctc tat aac aa gtactgccta tctgggcccc tctctctct 846  
 Ile Val Leu Tyr Asn Lys  
         125  
 taccctcttc tagacttgcc cttagctgtg ggggtgtagt gatccctct ccctaccaca 906  
 taacctgggt gccacgctgc cctggaagct tttccccagg acccttctaa gctgccaagc 966  
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cgctccccg gttcacgcaa ttctcctgcc tcaacctccc aaataactgg gactgcagggc 1626  
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 taccatcat gggagaggcc ttagttcaaa agtatttctc tctgaaggca gtgacttagg 1866  
 ggccttgctt aaatagaaat tcaagaaaga gccagtaagt tataaatagt ggcaagacaa 1926  
 aggacagcca cctttaaaag gcgggaaaac gtggaaagag ggtaaaatct gtttcagat 1986  
 tcctctggca cctactggtg ccctttggat aagcaagtgc tgactccagc aaggaagggc 2046  
 tgatgtcctg ccatcaggcc agcagacgct ggggccagggt gctcccctgc gtcgtgagtg 2106  
 tctcgaactt aacgagctc aatattctgg ggagaagttt tggtttcttt cagcccctgg 2166  
 gggctgccc tgggctcccg gcctccgggg ctgctcctca ggctggacag cctaggtgag 2226  
 ccctgccccg cctgccccca g a gcc gac gcg cag cct cca ggt tcc gcc agc 2278  
 Ala Asp Ala Gln Pro Pro Gly Ser Ala Ser  
 130 135

acc aac gtg gtc ctg cgc cac gat ggc gcc gtg cgc tgg gac gcg ccg 2326  
 Thr Asn Val Val Leu Arg His Asp Gly Ala Val Arg Trp Asp Ala Pro  
 140 145 150

gcc atc acg cgc agc tcg tgc cgc gtg gat gta gca gcc ttc ccg ttc 2374  
 Ala Ile Thr Arg Ser Ser Cys Arg Val Asp Val Ala Ala Phe Pro Phe  
 155 160 165 170

gac gcc cag cac tgc ggc ctg acg ttc ggc tcc tgg act cac ggc ggg 2422  
 Asp Ala Gln His Cys Gly Leu Thr Phe Gly Ser Trp Thr His Gly Gly  
 175 180 185

cac caa ctg gat gtg cgg ccg cgc ggc gct gca gcc agc ctg gcg gac 2470  
 His Gln Leu Asp Val Arg Pro Arg Gly Ala Ala Ala Ser Leu Ala Asp  
 190 195 200

ttc gtg gag aac gtg gag tgg cgc gtg ctg ggc atg ccg gcg cgg cgg 2518  
 Phe Val Glu Asn Val Glu Trp Arg Val Leu Gly Met Pro Ala Arg Arg  
 205 210 215

cgc gtg ctc acc tac ggc tgc tgc tcc gag ccc tac ccc gac gtc acc 2566  
 Arg Val Leu Thr Tyr Gly Cys Cys Ser Glu Pro Tyr Pro Asp Val Thr  
 220 225 230

ttc acg ctg ctg ctg cgc cgc cgc gcc gcc gcc tac gtg tgc aac ctg 2614  
 Phe Thr Leu Leu Leu Arg Arg Ala Ala Tyr Val Cys Asn Leu  
 235 240 245 250

ctg ctg ccc tgc gtg ctc atc tcg ctg ctt gcg ccg ctc gcc ttc cac 2662  
 Leu Leu Pro Cys Val Leu Ile Ser Leu Leu Ala Pro Leu Ala Phe His  
 255 260 265

cta cct gcc gac tca ggc gag aag gtg tgc ctg gcc gtc acc gtg ctg	2710
Leu Pro Ala Asp Ser Gly Glu Lys Val Ser Leu Gly Val Thr Val Leu	
270 275 280	
ctg gcg ctc acc gtc ttc cag ttg ctg ctg gcc gag agc atg cca ccg	2758
Leu Ala Leu Thr Val Phe Gln Leu Leu Leu Ala Glu Ser Met Pro Pro	
285 290 295	
gcc gag agc gtg ccg ctc atc ggg aag tac tac atg gcc act atg acc	2806
Ala Glu Ser Val Pro Leu Ile Gly Lys Tyr Tyr Met Ala Thr Met Thr	
300 305 310	
atg gtc aca ttc tca aca gca ctc acc atc ctt atc acg aac ctg cat	2854
Met Val Thr Phe Ser Thr Ala Leu Thr Ile Leu Ile Thr Asn Leu His	
315 320 325 330	
tac tgt ggt ccc agt gtc cgc cca gtg cca gcc tgg gct agg gcc ctc	2902
Tyr Cys Gly Pro Ser Val Arg Pro Val Pro Ala Trp Ala Arg Ala Leu	
335 340 345	
ctg ctg gga cac ctg gca cgg ggc ctg tgc gtg cgg gaa aga ggg gag	2950
Leu Leu Gly His Leu Ala Arg Gly Leu Cys Val Arg Glu Arg Gly Glu	
350 355 360	
ccc tgt ggg cag tcc agg cca cct gag tta tct cct agc ccc cag tgc	2998
Pro Cys Gly Gln Ser Arg Pro Pro Glu Leu Ser Pro Ser Pro Gln Ser	
365 370 375	
cct gaa gga ggg gct ggc ccc cca gcg ggc cct tgc cac gag cca cga	3046
Pro Glu Gly Gly Ala Gly Pro Pro Ala Gly Pro Cys His Glu Pro Arg	
380 385 390	
tgt ctg tgc cgc cag gaa gcc cta ctg cac cac gta gcc acc att gcc	3094
Cys Leu Cys Arg Gln Glu Ala Leu Leu His His Val Ala Thr Ile Ala	
395 400 405 410	
aat acc ttc cgc agc cac cga gct gcc cag cgc tgc cat gag gac tgg	3142
Asn Thr Phe Arg Ser His Arg Ala Ala Gln Arg Cys His Glu Asp Trp	
415 420 425	
aag cgc ctg gcc cgt gtg atg gac cgc ttc ttc ctg gcc atc ttc ttc	3190
Lys Arg Leu Ala Arg Val Met Asp Arg Phe Phe Leu Ala Ile Phe Phe	
430 435 440	
tcc atg gcc ctg gtc atg agc ctc ctg gtg ctg gtg cag gcc ctg tga	3238
Ser Met Ala Leu Val Met Ser Leu Leu Val Leu Val Gln Ala Leu	
445 450 455	
gggctgggac taagtcacag ggatctgctg cagccacagc tcctccagaa agggacagcc	3298
acggccaagt ggttgctggt ctttgggcca gccagtctct cccactgct cctaagatcc	3358
tgagacactt gacttcacaa tccacaaggg agcactcatt gtctacacac cctaactaaa	3418
ggaagtccag agcctgccac tcccctaatt ccaaaaaaaaa gaggaactct acaaaggcca	3478

agatcacaga gtacagtctt ggaggacag aattgtttgt gctgggtatt ggagctctca 3538  
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 ttccctaggtg gctgctttgc agggctttgg ctgttacctt tccctgctga ggggctcagg 3658  
 gaaaagggtc ggggattctc agtcgagttt ccagagcagg aggcctaca gacatttggc 3718  
 cccaaatccc tgactcaata aagtaagcgt gtacctaaaa aaaaaaaaaa aaaactcgac 3778  
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 <211> 457  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <221> SITE  
 <222> 101  
 <223> Xaa=uncertain

<400> 20

Lys Cys Val Phe Arg Val Arg Glu Cys Ser Ile Ala Ser Glu Val Leu  
 1 5 10 15

Lys Lys Pro Ala Arg Asp Gly Glu Val Glu Thr Glu Cys Leu Gly Ala  
 20 25 30

Glu Gly Arg Leu Ala Leu Lys Leu Phe Arg Asp Leu Phe Ala Asn Tyr  
 35 40 45

Thr Ser Ala Leu Arg Pro Val Ala Asp Thr Asp Gln Thr Leu Asn Val  
 50 55 60

Thr Leu Glu Val Thr Leu Ser Gln Ile Ile Asp Met Asp Glu Arg Asp  
 65 70 75 80

Gln Val Leu Thr Leu Tyr Leu Trp Ile Arg Gln Glu Trp Thr Asp Ala  
 85 90 95

Tyr Leu Arg Trp Xaa Pro Asn Ala Tyr Gly Gly Leu Asp Ala Ile Arg  
 100 105 110

Ile Pro Ser Ser Leu Val Trp Arg Pro Asp Ile Val Leu Tyr Asn Lys  
 115 120 125

Ala Asp Ala Gln Pro Pro Gly Ser Ala Ser Thr Asn Val Val Leu Arg  
 130 135 140

His Asp Gly Ala Val Arg Trp Asp Ala Pro Ala Ile Thr Arg Ser Ser  
 145 150 155 160

Cys Arg Val Asp Val Ala Ala Phe Pro Phe Asp Ala Gln His Cys Gly  
 165 170 175

Leu Thr Phe Gly Ser Trp Thr His Gly Gly His Gln Leu Asp Val Arg  
 180 185 190

Pro Arg Gly Ala Ala Ala Ser Leu Ala Asp Phe Val Glu Asn Val Glu  
 195 200 205

Trp Arg Val Leu Gly Met Pro Ala Arg Arg Arg Val Leu Thr Tyr Gly  
 210 215 220

Cys Cys Ser Glu Pro Tyr Pro Asp Val Thr Phe Thr Leu Leu Leu Arg  
 225 230 235 240

Arg Arg Ala Ala Ala Tyr Val Cys Asn Leu Leu Leu Pro Cys Val Leu  
 245 250 255

Ile Ser Leu Leu Ala Pro Leu Ala Phe His Leu Pro Ala Asp Ser Gly  
 260 265 270

Glu Lys Val Ser Leu Gly Val Thr Val Leu Leu Ala Leu Thr Val Phe  
 275 280 285

Gln Leu Leu Leu Ala Glu Ser Met Pro Pro Ala Glu Ser Val Pro Leu  
 290 295 300

Ile Gly Lys Tyr Tyr Met Ala Thr Met Thr Met Val Thr Phe Ser Thr  
 305 310 315 320

Ala Leu Thr Ile Leu Ile Thr Asn Leu His Tyr Cys Gly Pro Ser Val  
 325 330 335

Arg Pro Val Pro Ala Trp Ala Arg Ala Leu Leu Leu Gly His Leu Ala  
 340 345 350

Arg Gly Leu Cys Val Arg Glu Arg Gly Glu Pro Cys Gly Gln Ser Arg

355

360

365

Pro Pro Glu Leu Ser Pro Ser Pro Gln Ser Pro Glu Gly Gly Ala Gly  
 370 375 380

Pro Pro Ala Gly Pro Cys His Glu Pro Arg Cys Leu Cys Arg Gln Glu  
 385 390 395 400

Ala Leu Leu His His Val Ala Thr Ile Ala Asn Thr Phe Arg Ser His  
 405 410 415

Arg Ala Ala Gln Arg Cys His Glu Asp Trp Lys Arg Leu Ala Arg Val  
 420 425 430

Met Asp Arg Phe Phe Leu Ala Ile Phe Phe Ser Met Ala Leu Val Met  
 435 440 445

Ser Leu Leu Val Leu Val Gln Ala Leu  
 450 455

&lt;210&gt; 21

&lt;211&gt; 25

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 21

cctccagggt cacattcaga gtctg

25

&lt;210&gt; 22

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 22

cagcttgaga gccagccggc

20

&lt;210&gt; 23

&lt;211&gt; 31

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer



<400> 23  
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31

<210> 24  
<211> 32  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

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cgtctagatg acttagtccc agccctcaca gg

32